Controlling Pests

WHAT ARE PESTS?

Most people equate pests with insects. But pests aren't limited to insects. Bacteria, mildew, viruses, weeds, rodents, and deer all take their turn as a gardener's nemesis. And all bacteria and insects aren't harmful to your plants. Gypsy moths are often controlled by an aerial spray of a bacteria that harms the gypsy moth but doesn't harm beneficial insects. Gardeners spend many dollars acquiring ladybugs and praying mantises for their garden or greenhouse, hoping that they will consume other insects.

Rather than planting the right plant in the right place to avoid pest problems, people have depended on chemicals to control pests. Home gardeners often use more pesticides per square foot in their gardens than farmers do in the fields. Improperly applied, pesticides can make you sick, pollute waters, and poison fish, plants, and animals living in and around water.

A pesticide is any chemical used to kill or harm a pest. The word "cide" comes from Latin and means "to kill." When you visit a store to purchase a pesticide, you will find products that are labeled insecticide (kills insects), herbicide (kills weeds), fungicide (kills fungus), and so forth.

Biological alternatives have been developed as the limitations of chemicals and their negative effects become known. Combinations of techniques, including companion plantings and the introduction of beneficial insects to keep damage to acceptable levels, provide the most favorable approach.

INTEGRATED PEST MANAGEMENT

Integrated pest management (IPM) is a wholistic approach to pest control. It integrates chemical, cultural (cultivating, weeding, mulching), and biological pest control techniques to reduce the pest population and keep damage to an acceptable level.

PRINCIPLES OF IPM

Pests Are Never Completely Eliminated

The basic principle of IPM is the acceptance of a certain number of pests and a certain level of damage to your plants. This acceptance reduces the need for drastic measures as large infestations are kept in check by one of the techniques being used.

The Entire Landscape Is Part of the Management Plan

You must understand how all parts of your landscape, including its pest population, work together. Your lawn, garden, trees, shrubs, and pond must be looked at as one when you take action to control pests. Associations may exist between parts of the landscape which, if altered, could impact pests and either increase their population or reduce it in other parts of the landscape.

Use of Natural Controls Is Maximized

Take advantage of the biological controls already in your garden by encouraging natural predators and parasites. You may also purchase natural predators, but they are likely to move on as soon as they have devoured your infestation.

Use various insect traps to reduce the insect population levels. Upturned flower pots, bamboo lengths, boards, and such will trap earwigs and sowbugs; collect them every morning and feed them to pet frogs, toads, turtles, and fish, or destroy them with boiling water. Slugs can also be killed this way.

Use your fingers. Pick up the insects and pinch them. If you are squeamish, put them in a jar and drown them.

Use chemicals as a last resort. Encourage natural predators and other beneficial organisms to thrive in your landscape. If you use chemicals, apply them very carefully to avoid harming beneficial insects and plants.

Choose Plants Wisely Select disease-resistant varieties and rotate your vegetable crops. Use plants adapted to the soil pH, drainage, amount of sun, and other environmental conditions.

Use Good Cultural Practices Proper landscape maintenance is the foundation of IPM. Healthy plants are more resistant to insects and disease than stressed plants. Space your plants and prune them to improve air circulation. Prune out infected plant parts and rake up diseased leaves. Water your plants in the morning, giving wet foliage time to dry before evening temperatures fall.

Management Requires Cooperation Knowledge from gardeners, soil scientists, horticulturists, foresters, entomologists, and other experts is often required to produce effective results.

TECHNIQUES FOR YOUR LANDSCAPE

The most effective practice is to regularly observe what is going on in your landscape. Early detection can halt or slow pest problems. The following practices can help to ensure a healthy garden and landscape.

- Build a biologically active, healthy soil through regular addition of organic matter.
- Grow winter annual cover crops to provide additional organic matter.
- Water in the morning so your plants are dry before nightfall.
- Plant crops suited to your soil and climate.
- Interplant crops to slow the spread of disease, insects, and weeds.
- Research and learn about insects, animals, and birds that prey on pests.
- Encourage the natural enemies of pests to live in your landscape.
- Thin young plants to reduce overcrowding.
- Mulch your plantings to reduce the splashing of soil-borne diseases and weed growth.
- Rotate your garden plantings. Do not grow the same kind of produce in the same spot year after year. Give the spot several years of other plants with other predators, and remove the food source for the original predator.
- Keep your plants healthy. Cuts, bruises, and cracks are often the site of infection or infestation.
- Do not use or dispose of tobacco products in your garden. They can carry diseases infecting tomatoes, pepper, and eggplant.
- Remove any diseased or infested materials immediately.
- After harvesting, remove healthy plant material from your garden and compost it.
- Keep refuse and old sacks or wooden containers out of your garden.
- Stake plants to keep fruits off of the ground.
- Time your plantings to avoid peak insect infestations. Monitor your pest problems and note the date of greatest infestation. Change your planting calendar the next year.
- Inspect your plants for larvae, eggs, caterpillars, or insects. Remove them by hand, brushing them into a container and covering them with boiling water.

INSECT CONTROL

Insects can be a challenge. By gluing themselves to the surface of your plant and feeding, burrowing into your plant's roots, or spreading diseases, insects can create problems in the most well kept gardens and landscapes. While some insects are harmful, others are not. It is well worth your time to determine which insects are to be cultivated and which should be removed as soon as you see them.

You can prevent many problems by preparing a healthy soil and planting resistant plant varieties. Beware of using compost not fully decayed, as insect eggs may have been deposited on plants during their growing season. The compost pile must reach a temperature between 140 and 160 degrees Fahrenheit to kill insects, weed seeds, and disease organisms. Regularly observe your plants for any larvae, eggs, or insect infestations.

BENEFICIAL INSECTS AND OTHER GARDEN FRIENDS

Many beneficial insects can thrive in your garden, feasting on other insects you would have to pay to eradicate. Praying mantises, ladybugs, lacewings, ground beetles, and other insects are natural predators to many of the pests common in garden and landscape plantings. Learn about the food and habitat

preferences of these beneficial species, and create ideal conditions for them. Become familiar with the eggs and larvae of the beneficial insects, and avoid harming them.

Spiders, toads, dragonflies, and bats depend on insects for the majority of their diet. By constructing a bat house or building a pond, you can encourage these creatures to live in and around your landscape to help control populations of harmful insects.

Domestic birds, such as chickens, and wild birds, such as purple martins, can also help control insects in gardens. But you may want to cover your ripening fruits with netting. Fresh, home-grown strawberries or blueberries appeal to more than just you!

INSECTICIDES

Many insecticide products are available. However, if you use insecticides you will drastically reduce beneficial insects. Alternatives to synthetic chemicals include biological and biochemical pesticides, and commercial insecticide soaps. Choose the least toxic insecticide that will do the job. Consult Virginia Cooperative Extension for pest-specific advice.

WEED CONTROL

Weeds invade lawns, gardens, and landscaping and may overrun desirable plants. Controlling weeds can be an intensive task requiring continual care and maintenance. Once your desired plantings have become established, your weeding chores should diminish. Weeds need light for their seeds to germinate and food and water for strong growth. Crowd them out of your garden by selecting plants you desire that will flourish instead.

WHAT IS A WEED?

A weed is a plant out of place. Weeds choke and crowd ornamental plantings, native species in natural areas, vegetable gardens, and your lawn.

As plants have been introduced for ornamental, conservation, or other purposes, some have escaped and thrived in areas where they are not wanted. These weeds are called invasive plants. They reproduce quickly without natural competitors and create serious threats to local ecosystems and native wildlife. Even some plants native to their site are now labeled as invasive because their habitat's natural balance has been changed.

WEED REDUCTION STRATEGIES

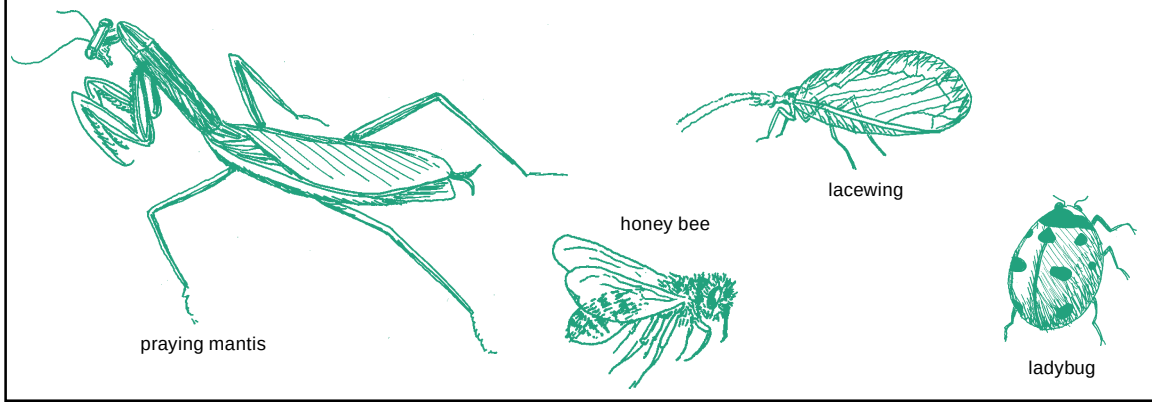
Many tactics can be used to keep weeds in check before chemical applications are necessary. These practices can reduce the need for herbicides and become a part of your regular maintenance program.

Weeding Hand weeding is an effective way to remove smaller herbaceous growth. Disturb the soil as little as possible, and cover any disturbed areas to discourage further weedy invasion. Small shrubs and trees can be removed, root and all, by digging or using a tool such as the "Weed Wrench" or "Root Jack." These are lever tools with a clamp at the bottom to grasp the stem of a plant. Leaning back on the lever closes the clamp, and the weed is pulled out of the ground with its roots intact.

Mowing Control the seedheads on weeds and grasses by mowing your lawn at a height of 3 inches. A healthy, deeply rooted lawn is likely to crowd out most weeds.

Mulching Place a layer of clean mulch on bare areas to discourage weeds from sprouting. Many plants need light to germinate. Bark, leaves, or straw, free of weed seeds, are effective weed controls.

Beneficial Insects



Tilling When weeds are prolific, plowing under or tilling the ground may be necessary to kill thick stands. Be sure to plow or turn over the ground with a shovel before the weeds have gone to seed. Using the right plow share or shovel, clip the roots and turn the plants upside down, smothering them and preventing further growth.

HERBICIDES

The last defense against weeds should be the use of chemical herbicides. If an herbicide is needed, use the least persistent, most effective, and most environmentally friendly product you can find. Use the information on the label under Environmental Hazards to guide your choice or contact Virginia Cooperative Extension for recommendations.

Common Weeds

Crab Grass Commonly found in unkempt lawns. Keep turf grass thick and healthy. Mow high.

Dandelion A persistent perennial with broad notched leaves and yellow flowers. If not many, pick off yellow flowers so seed heads are not produced. Otherwise dig out the long tap root.

Chickweed Common perennial found in disturbed areas. Keep disturbed soil to a minimum.

Clover A biennial weed used as forage, but invasive to lawns.

Morning Glory Twining vine with deep roots which send up new plants. Dig to remove plant.

Creeping Charlie Low growing weed that likes moist soils. Roots along the stem. Pull out when soil is moist.

Plantains Broadleaf weeds with a deep tap root. Dig to remove.

HOW PESTICIDES WORK

INSECTICIDES

Most insecticides must get inside the organism to be effective. Apply a chemical to the leaves to serve as a stomach poison if the target insect eats plant leaves. Apply insecticide to the soil to be picked up by the plant roots and moved systematically through the plant if the insect sucks the juice from plants. As the insect sucks the plant juices, the insecticide is ingested until a toxic level is reached.

HERBICIDES

Weeds present a different kind of problem. In the typical agricultural acre, the weed seed population is about 200 million. Over the centuries, weed control has evolved from hand pulling, to hoeing, to animal-drawn or mechanized cultivators, to herbicides.

There are three basic types of herbicides.

- Contact herbicides that kill or stunt growth on contact
- Systemic or growth-regulator herbicides, which may be applied either to plant or soil
- Soil-active types designed for preemergence control

FUNGICIDES

Fungi cause leaf spots, rusts, mildews, smuts, cankers, and rots. Fungicides must be selectively toxic in order not to damage the plants while attacking the fungi.

USING PESTICIDES SAFELY

The most important step in using pesticides is to read the label on the product. Many times manufacturers will print leaflets or brochures with additional instructions. Be sure to read this information each time you use a pesticide. Do not depend on your memory!

LABELS

Remember, the label is the law. Understanding a pesticide label can be a difficult task, but it is the most important one when applying pesticides. Every label will contain the ingredients, registration number, precautions, environmental hazards, signal words, directions, and a misuse statement.

Ingredients Each label must list the names and amounts of the active ingredients and the amount of inert ingredients in the product.

Registration Number This number must be on every label. It shows that the product has been approved by the Environmental Protection Agency for the uses listed.

Precautions The precautions section has a title similar to “Hazards to Humans and Domestic Animals” and identifies the ways in which the product may be poisonous. It will also describe special steps necessary to avoid poisoning, such as the kind of protective equipment needed. If the product is highly toxic, this section will inform physicians of the proper treatment for poisoning.

Environmental Hazards This tells how to avoid damaging the environment, such as contaminating surface water supplies.

Signal Words and Symbols Pesticides are identified according to their toxicity with a signal word or symbol on the label. Highly toxic pesticides are generally not sold for home and garden use.

Directions for Use This section identifies what pests the product will control, on what crops the product can be used, how the product should be applied, how much to use, where and when it should be applied, and how close to the harvest period the product can be applied.

Misuse Statement Manufacturers will remind you that it is a violation of federal law to use a product in a manner inconsistent with its labeling.

STORING PESTICIDES SAFELY

Pesticides should be purchased in limited quantities. Anticipate the amount you will use each year as pesticides have a limited shelf life.

If pesticides need to be stored, keep them in their original containers with the label intact. Keep them in a cool, dry place that can be locked. Protect pesticides from temperature extremes as they may be altered by freezing or heat. Never store pesticides in your home near food, and keep them away from sinks, pantries, and medicine cabinets. Never reuse containers.

APPLYING PESTICIDES SAFELY

Choose the pesticide that will best serve your needs and is the least toxic. Compare products and look for signal words such as CAUTION, WARNING, DANGER. The signal word DANGER will be accompanied by a skull and cross bones symbol. These are the most toxic pesticides and generally should not be applied by a homeowner. Be sure you are prepared to follow the application instructions with the appropriate gear. If you do not have the needed equipment, you will need to purchase and maintain it. If you select a pesticide that must be mixed, be sure you have the capabilities to safely follow the manufacturer's recommendations.

Always read the label first. Determine the right amount of the right pesticide to use. Over-dosage is wasteful. It won't kill more insects; it will wash into your local stream; it may be injurious to plants; and it may leave a harmful residue on fruits and vegetables that will make you ill.

Follow these tips when using pesticides.

- Be careful not to get pesticides on your food, dishes, or cooking utensils.
- Remove pets and their food and water pans before applying pesticides.
- Keep people, particularly children, away from areas where you are mixing or applying pesticides.
- Dilute or mix sprays outdoors or in a well-ventilated place where there is no wind.
- Be sure to avoid breathing pesticide dusts or mists. Keep your face away from, and to one side of, the cap when opening a container.
- Handle liquid concentrates and oil-base sprays as though they are flammable.
- Place poison bait out of reach of children and pets. (Baits for rats, ants, and roaches account for a high percentage of the cases of accidental swallowing of pesticides by children under 12 years of age).
- Do not use a pesticide in your home if the label says a gas mask is required in its application. An inexpensive dust mask is of no value.
- In handling any pesticide, avoid contact with your skin. Use protective equipment if the label recommends it. Avoid excessive contamination of clothing when spraying or dusting.
- Do not use your mouth to blow out clogged lines, nozzle tips, or other equipment parts, or to siphon a pesticide from a container.
- Do not smoke while handling pesticides.
- When spraying or dusting pets, be sure the pesticide is labeled for such use.
- Clean up and wash the exposed parts of your body after using pesticides.
- Wash your clothing separately from your family's laundry.

Signal Words

The following signal words are required on labeling by the Federal Hazardous Substances Act.

- **DANGER** the product is corrosive, extremely flammable, or highly toxic
- **WARNING** the product is moderately toxic or hazardous
- **CAUTION** the product is slightly hazardous or toxic

PROTECTING WILDLIFE, FISH, AND HONEYBEES

When applying pesticides to extensive land areas, take every precaution to avoid contaminating streams, lakes, or ponds. Avoid contaminating your fish pond in your own garden. Do not apply pesticides (particularly insecticides) to fish-bearing water unless the label specifically recommends the material for such uses, and then apply it only at the specified rates.

Bees and other pollinating insects visit plants at certain times of day and in certain seasons. To prevent the loss of these beneficial insects, do not apply pesticides between 9:00 a.m. and 6:00 p.m. To avoid drift, don't spray or dust in the garden on a windy day.

PROTECTING CROPS AND PLANTS

Apply pesticides only to the plants listed on the label. Be sure to read the label before applying pesticides to growing vegetables or fruits. Don't apply pesticides to fruits and vegetables close to harvest. When applying pesticide to unwanted plants, be careful that the drift from the spray doesn't wipe out your cherished plants as well.

PROTECTING DRINKING WATER

Do not apply pesticides near wells. You may contaminate your drinking water.

DISPOSING OF PESTICIDES SAFELY

Clean all equipment immediately after use. Pesticides should not be stored after they have been mixed. Rinse glass or metal containers with water, and dispose of them properly according to label directions. Rinse the container out first, pouring the rinse water into the spray tank. Do this three times. Spray the rinse water over a broad area to further dilute the pesticide. Many communities will have a local hazardous waste cleanup day. If your community does not, place empty containers in refuse cans destined for a sanitary landfill. Wrap containers in newspaper and secure before disposal.

Never rinse pesticides down the storm drain. You may contaminate both the surface water and the groundwater.

POISON CONTROL CENTERS

The "Precautionary" statement on the product label will identify steps to take if poisoning occurs. In case of poisoning, call your physician or poison control center immediately and have the label with you. Identify the active ingredients and how the poison was contacted and in what amount. If your physician is not available, go to a hospital emergency room and take the container with you.

The physician will call the poison control center for further information as to the toxicity of the suspected agent, treatment, and prognosis. Do not panic. You will have enough time. Just do not delay!

FOR MORE INFORMATION

- Virginia Cooperative Extension
- Look in the front of your telephone book for the nearest poison control center.